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AIR QUALITY
PROGRAM

December 5, 2008

Ms. Stacy Froelich
Natural Resource Project Engineer
Air Quality Program
South Dakota Department of Environment and Natural Resources
623 East Capitol
Pierre, SD 58501-3182

RE: Completeness Determination and Request
Basin Electric Cooperative NextGen Power Project

Dear Ms. Froelich:

Thank you for providing your completeness determination regarding Basin Electric Power Cooperative's (Basin Electric) PSD Permit Application for the NextGen Power Project near Selby, South Dakota. We are in receipt of your letter of November 14, 2008, which designates the completeness determination and your request of one additional item of information.

Attached you will find our response to your request for an analysis of plume impacts at nearby campgrounds using the VISCREEN Level 2 analysis and the 10-m wind speed and direction that were measured at our monitoring site.

Your November 14, 2008 letter states that:

"Appendix W recommends that for dispersion models that employ P-G stability categories for the characterization of the vertical or lateral dispersion, the P-G stability category be estimated using the Turner Method with site specific wind speed measured at or near 10-meters and representative cloud cover and ceiling height."

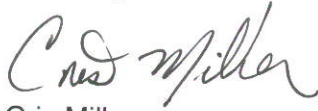
As you recall Basin Electric provided to you the VISCREEN Level 2 analysis utilizing the 100 m wind speed and direction for transport level winds and the 10-m winds for stability category. We find this interpretation of using the 10-m winds as applicable to determining stability category only, not for applying to transport level winds. In modeling the NextGen case, the P-G stability category is determined by turbulence measurements, which effectively is similar to using the 10-m wind speed as a determinant in stability category. We do not interpret this statement as requiring 10-m wind speeds to be used for transport calculations. This interpretation is consistent with using the 100-m winds for plume transport.

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Nevertheless, Basin is providing the attached summary of VISCREEN results using both the 100-m and 10-m wind speeds for transport. We hope that this submittal is satisfactory, and we look forward to responding to any additional requests for information that you may require.

Sincerely

A handwritten signature in cursive script, appearing to read "Cris Miller".

Cris Miller
Senior Environmental Project Administrator

/gmj
Enclosure

Summary and Comparison of Requested VISCREEN Modeling For Campgrounds within 50-km of Basin Electric NextGen Facility

The original application (Section 8.4) provided Level-2 VISCREEN results for the four campgrounds within 50 km of the project site. Details were discussed in that application. Results were provided for both the mean background visual range (110 km) and the Natural Background (FLAG) visual range (243 km). Thus, the proposed use of the FLAG background visual range represents the experience of a visitor in a "natural" condition assuming there are no man-made emissions to the atmosphere.

The Level 2 VISCREEN analysis followed the guidance provided in the Workbook, estimating two visual impact parameters: plume perceptibility (ΔE) and plume contrast (C_p). ΔE is an integral measure of the human psychophysical response to the difference in coloration and brightness accounting for light intensity for all visible wavelengths, comparing a line-of-sight passing through the plume centerline and the same line-of-sight in the absence of the plume (i.e., background sky). C_p is a much simpler parameter that is the fractional increase or decrease in light intensity along a line-of-sight at a single 550 nm (green) wavelength, which is the center of the visible spectrum, due to the presence of a plume compared to the background sky.

Screening-level guidance provided in the Workbook indicates that values above 2.0 for ΔE and ± 0.05 for C_p are considered perceptible for a casual observer. Because these are not Class I areas, there is no regulatory requirement that modeled worst-case visibility parameters be below these guidelines. However, these visibility parameter guidelines are useful in determining whether a visitor is likely to observe a visible plume when visiting the state parks.

The VISCREEN default background ozone concentration of 0.04 ppm was applied to both analyses. This is generally a representative value for low-pollution days that are represented by the median or natural background conditions for this area, in accordance with the monitored data. The intention of the Level 2 analysis is to estimate the degree of plume visibility that would be expected for the highest impact one day per year. The visibility analysis presented here focused on the daytime period (nominally assumed to be between 6 AM and 6 PM CST) when there is sufficient sunlight for a plume to be seen.

The visibility analysis conducted for the permit application applied meteorological conditions conservatively representative of winds at stack height so that plume transport would be appropriately characterized. At the request of SDDENR, Basin here also provided an analysis of plume visibility using the monitored 10 m wind speed and direction. Given the stack height of 625 feet (190 m), the 100 m winds are much more representative of plume transport direction and dispersion than the lower level winds, which are lighter and influenced by a variety of factors that do not affect the wind at plume level. This supplemental analysis is provided for informational purposes only, as these results are not representative of actual plume transport but for a hypothetical low-level plume.

In preparing to conduct the hypothetical supplemental analysis it was determined corrections to the computer code that determines the meteorological conditions for the worst-case day for the Level 2 visible plume assessment were in order. These corrections stemmed from an oversight in EPA's instructions for Level 2 visibility analyses (page 45 of the Visibility Workbook) where the prescribed categories of wind speed and stability may not cover all possible combinations in an actual meteorological data base (e.g., stability F and 4 m/sec wind speed). Corrections were made to the

AECOM Environment computer code and the analysis was conducted for winds at both the 100 m and 10 m levels.

The plume visibility results for the 100 m wind are presented below in a revision to Table 8-5 and the results for 10 m winds are provided in Table 8-5a

Table 8-5 Level 2 Visibility Assessment Results – 100-m Winds-Daytime (6 AM to 6 PM CST)

Recreation Area	Mean Background Visual Range (110 km) ¹		Natural Background Visual Range (243 km) ²	
	ΔE	Cp	ΔE	Cp
Indian Creek	0.624	0.007	1.023	0.022
Swan Creek	0.604	0.007	0.993	0.021
West Pollock	0.356	0.004	0.658	0.013
West Whitlock	0.320	0.003	0.595	0.012
Thresholds	2.0	0.05	2.0	0.05

Table -8-5a Level 2 Visibility Assessment Results – 10-m Winds-Daytime (6 AM to 6 PM CST)

Recreation Area	Mean Background Visual Range (110 km) ¹		Natural Background Visual Range (243 km) ²	
	ΔE	Cp	ΔE	Cp
Indian Creek	0.994	0.011	1.626	0.034
Swan Creek	1.785	0.019	2.914	0.062
West Pollock	0.475	0.005	0.875	0.018
West Whitlock	1.265	0.014	2.337	0.048
Thresholds	2.0	0.05	2.0	0.05

The results of the visual plume modeling are compared to the accepted significance threshold (USEPA 1992) of $\Delta E = 2.0$ and $Cp = 0.05$. As the data in **Table 8-5** show, all impacts for both background visual ranges are less than the significance thresholds, using the 100-m winds. The analysis concludes that visual impacts at these campgrounds will not be significant. For the hypothetical 10-m plume, the Level 2 modeling indicates that the plume would not be visible for the actual mean background visual range, but could be visible at two of the campground areas under natural background visual range conditions.